

A2 CC Q4 Test 3 Review Key

1) Mutually exclusive. They can not occur at the same time

2) Mutually exclusive.

3) Independent. The coin and die have no effect on each other.

4) Dependent. The second marble that you take out depends on the first marble that was taken.

$$\begin{aligned} 5) P(\text{page 3 or page 7}) &= P(\text{page 3}) + P(\text{page 7}) - P(\text{3 and 7}) \\ \text{Mutually exclusive} \quad \therefore P(\text{3 and 7}) &= 0 \\ &= \frac{1}{14} + \frac{1}{14} - \frac{0}{14} = \frac{2}{14} = \boxed{\frac{1}{7}} \end{aligned}$$

$$\begin{aligned} 6) P(\text{Heads and Even}) &= P(\text{Heads}) \cdot P(\text{Even}) \\ \text{Heads and Even} & \text{ are independent} \\ &= \left(\frac{1}{2}\right) \cdot \left(\frac{3}{6}\right) = \frac{3}{12} = \boxed{\frac{1}{4}} \end{aligned}$$

$$\begin{aligned} 7) P(\text{Black or odd}) &= P(\text{Black}) + P(\text{odd}) - P(\text{Black and odd}) \\ \text{Dependent because} & \text{ there are odd black cards:} \\ &= \frac{5}{8} + \frac{5}{8} - \frac{3}{8} = \boxed{\frac{7}{8}} \end{aligned}$$

$$8) P(\text{Apple}) \cdot P(\text{Peach} | \text{Apple}) =$$

$$\left(\frac{5}{12}\right) \cdot \left(\frac{7}{11}\right) = \boxed{\frac{35}{132}}$$

$$9) P(A) \cdot P(B) = P(A \text{ and } B)$$

$$\left(\frac{2}{5}\right) \cdot \left(\frac{1}{5}\right) = \frac{2}{25}$$

$$\frac{2}{25} = \frac{2}{25}$$

Independent

$$10) P(A) \cdot P(B) = P(A \text{ and } B)$$

$$\frac{2}{5} \cdot \frac{1}{4} = \frac{1}{25}$$

$$\frac{2}{20} \neq \frac{1}{25}$$

Dependent

$$11) P(A) = \frac{11}{20} \quad P(A \text{ or } B) = \frac{283}{400} \quad P(A \text{ and } B) = \frac{77}{400}$$

$$P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$$

$$P(A \text{ or } B) - P(A) + P(A \text{ and } B) = P(B)$$

$$\frac{283}{400} - \frac{11}{20} + \frac{77}{400} = \frac{7}{20}$$

$$P(\text{not } B) = 1 - \frac{7}{20} = \boxed{\frac{13}{20}}$$

12) $P(B|A) = \boxed{\frac{3}{5}}$ If the events A and B are independent then the idea that A happened has not bearing on B.

$$13) P(A \text{ and } B) = P(A) \cdot P(B)$$

$$P(A \text{ and } B) = \left(\frac{3}{10}\right) \cdot \left(\frac{13}{20}\right)$$

$$P(A \text{ and } B) = \boxed{\frac{39}{200}}$$

14) $P(A \text{ or } B) = P(A) + P(B)$ If they are mutually exclusive.

$$11 \quad \frac{4}{5} = \frac{3}{10} + \frac{1}{2}$$

$$\frac{4}{5} = \frac{3}{10} + \frac{5}{10}$$

$$\frac{4}{5} = \frac{8}{10}$$

$$\frac{4}{5} = \frac{4}{5} \quad \checkmark$$

Mutually Exclusive